

WHAT IS CLAIMED IS:

1. An ashing method comprising:
providing a substrate having a resist layer and implanted elements, and placing
5 said substrate into a first processing chamber;
introducing substantially pure oxygen into said first processing chamber at a first
partial pressure above 100 Torr; and
varying the temperature of an internal environment of said first processing
chamber to cause said oxygen to oxidize said resist layer to remove said resist layer from
10 said substrate.
2. The method of Claim 1, wherein introducing substantially pure oxygen
into said first processing chamber at said first partial pressure comprises introducing
substantially pure oxygen into said first processing chamber at a first partial pressure of
15 760 Torr.
3. The method of Claim 1, wherein varying the temperature of said internal
environment of said first processing chamber comprises increasing the temperature of
said internal environment to a temperature up to between about 700° C and 1300° C.
20
4. The method of Claim 1, wherein introducing substantially pure oxygen
into said first processing chamber at said first partial pressure comprises introducing said
oxygen at a first partial pressure of about 760 Torr; and
wherein varying the temperature of said internal environment of said first
25 processing chamber comprises increasing the temperature of said internal environment to
a temperature up to about 700° C.
5. The method of Claim 4, wherein varying the temperature of said internal
environment of said first processing chamber comprises increasing the temperature of
30 said internal environment from a temperature of up to about 700° C to a temperature up to
about 1300° C.
6. The method of Claim 1, further comprising:

annealing said substrate in a second processing chamber to activate said implanted elements.

7. The method of Claim 6, wherein said first processing chamber and said
5 second processing chamber are the same chamber.

8. The method of Claim 1, wherein said oxidation of said resist layer to
remove said resist layer from said substrate yields CO₂ and H₂O.

9. The method of Claim 1, wherein said first processing chamber is
10 configured to hold a plurality of substrates.

10. The method of Claim 1, further comprising introducing cleaning gases and
steam, together or separately, into said first processing chamber to facilitate the removal
15 of resist residue.

11. An ashing method comprising:
introducing substantially pure oxygen into an internal environment of a first
processing chamber to a first partial pressure;
20 maintaining said internal environment of said first processing chamber at a first
annealing temperature; and
introducing a substrate having a first temperature and a resist layer formed thereon
into said internal environment of said first processing chamber allowing said resist to be
oxidized as said substrate heats from said first temperature to said annealing temperature.

25

12. The method of Claim 11, wherein said first partial pressure is between
about 100 Torr and 760 Torr.

13. The method of Claim 11, wherein said first temperature is an ambient
30 temperature.

14. The method of Claim 11, further comprising allowing said substrate to
heat to said annealing temperature causing said substrate to be annealed.

15. The method of Claim 11, wherein said annealing temperature ranges from between about 700° C and 1300° C.

16. The method of Claim 11, further comprising introducing cleaning gases
5 and steam, together or separately, into said first processing chamber to facilitate the removal of resist residue.

17. The method of Claim 11, wherein said introducing a substrate having a first temperature and a resist layer formed thereon into said internal environment of said
10 first processing chamber comprises introducing a plurality of substrates having a first temperature and a resist layer formed thereon into said internal environment of said first processing chamber.

18. An ashing method comprising:
15 providing a substrate having a resist layer formed thereon and placing said substrate into an internal environment of a first processing chamber;
introducing substantially pure oxygen into said internal environment of said first processing chamber at a first partial pressure of between 100 Torr and 1000 Torr;
increasing a first temperature of said internal environment of said first processing
20 chamber to a second temperature causing said substantially pure oxygen to react with said resist layer to oxidize said resist layer; and
increasing said second temperature to a third temperature.

19. The method of Claim 18, wherein said third temperature is greater than
25 said second temperature.

20. The method of Claim 18, wherein said increasing said first temperature to a second and said increasing said second temperature to said third temperature comprises a gradually continuous process.